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Sustainable Urban Qualities in the Emerging City of Doha

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Abstract:
Various urban qualities are required for sustainable urban development, which is a particular challenge in the case of emerging cities such as Qatar's capital Doha. Therefore, this paper seeks to introduce a framework concerning how to investigate urban qualities and their production in space in order to clarify the challenges and limitations of planning for sustainability. The paper is based on analyses and evaluations of GIS data as well as a series of interviews with ten planning experts at the Ministry of Municipalities and Urban Planning and a series of questionnaires received from 350 inhabitants. After introducing the basic framework as a model, the three dimensions of sustainability – ecological efficiency, economic growth and social equity – are analysed in relation to the urban qualities needed for producing them. In conclusion the general challenges in establishing sustainable urban development mechanisms in Doha are discussed.

Keywords: Sustainability, urban quality, urbanism, urban planning, emerging city, Doha

Introduction

The use of the term "sustainability" has a rather short history and often refers to the definition made at the Brundtland Commission of the United Nations in 1987: "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs* (United Nations, 1987)." Contemporary urban research on sustainability often focuses on environmental concerns by exploring more efficient urban structures as well as technologies to reduce energy waste. However, in addition to ecological balance the sustainability of urban environments is highly dependent on economic growth and social equity. Holistic sustainability in an urban context can thus only be achieved if social, economic and environmental aspects are understood in relation to each other. Thus, in order to elaborate a more holistic model of sustainable urbanism a theory about the production of urban environments must be used as a basis. One of the most influential theories about space production in the case of cities was developed by the French sociologist Henri Lefebvre, who distinguished three main spaces – conceived, perceived and lived space (Lefebvre, 1991). All three spaces contribute to the production of the urban environment through conscious decision-making (conceived), physical spatial practice (perceived) and subjective identification processes (lived) (Wiedmann, Salama and Thierstein, 2012a).

This basic triad can be found in many scientific areas, including psychology, and is thus an ideal starting point for investigating sustainable urbanism as a product of three main urban qualities.

- *Urban governance responsible for the supply of efficient urban structures:*

The supply of an efficient urban structure is to a large extent the result of the implementation of guidelines and regulations related to policies and physical planning. These legal frameworks for urban developments are in turn based on visionary decision-making regarding overall development goals and strategies, particularly public investments. Thus, three dimensions of urban governance can be distinguished, namely, the definition of an urban vision, decision-making regarding strategies and the organisational administration of urban growth. Subsequently, an efficient urban structure is only possible if the urban vision and the associated development goals reflect existing conditions and potentials. Public investment and liberalisation strategies usually have the most immediate impact on urban efficiency. Furthermore, regulations need to be implemented by a capable urban administration in order to guide developments toward urban consolidation. This can include land-use guidelines as well as the introduction of rating systems such as LEED (Leadership in Energy and Environmental Design) for the promotion of ecological design.

- *Spatial practice responsible for the diversification of structures:*

While urban governance is responsible for the supply of an efficient urban structure, it is the various users of space themselves who appropriate the urban environment according to their requirements. This appropriation is needed for the urban quality of diversity, which is essential for economic growth and flexibility. In most service-oriented economies three main groups, who are usually linked to transnational networks, can be identified as the main actors within urbanism, namely investors, companies and inhabitants (Smith, 2005). Developers appropriate space by building it according to investor interests, which are either short-term or long-term oriented depending on the overall contexts of future economic perspectives and current legal possibilities. Companies balance between accessible and affordable locations for their offices based on their general business plans and markets. Thus, company networks are in most cases decisive when it comes to diversifying urban structures due to their role in establishing a hierarchy of business centres (Luethi, Thierstein and Goebel, 2010, p. 120). Last but not least, the movements of inhabitants, who are often migrants in the case of emerging cities, can appropriate space through how they distinguish between frequently and less frequently visited places. One major aspect of these networks of inhabitant movements is the location of residence and its spatial relation to working place, services and amenities (Salama and Gharib, 2012).

- *Inhabitants' identification of their surroundings as basis for social equity:*

In addition to the conscious planning and the collective physical appropriation of space based on needs, the third dimension of space production is the subjective individual identification of inhabitants with space. This identification process is the basis for social consolidation and equity because it is rooted in a long-term commitment from inhabitants to the space and reflects a general satisfaction (Baris, Uckac and Uslu, 2009, p. 733). The

reasons for a close intimacy between inhabitants and urban environments include general liveability concerns as well as individual perspectives of future prosperity and cultural aspects (Salama, 2005). Liveability is enhanced if an urban environment creates the impression of being a healthy and comfortable place. In turn, individual links to cities are increased if developments implicate future professional success. Thirdly, cultural values are expressed by the aesthetics of the surroundings as well as general human behaviour, which must be coherent with individual cultural perspectives in order to initiate an identification process. These three factors cooperatively create the identification of a society with its surroundings, which is the basis for an emerging urban identity beyond the simple approach of public and private initiatives of using landmarks to brand cities. Thus, urban identity in its original meaning is an indicator for a cohesive and healthy urban society (Lalli, 1992, p. 286). This identification process can only be empirically measured to a rather limited extent by interviewing a certain quantity of inhabitants. It thus often remains a hidden but decisive factor in establishing urban sustainability.

Consequently, three main urban qualities can be distinguished, which in turn are the basis for sustainable urbanism. The supply of an efficient urban structure by urban governance is the key to improving the ecological balance of cities. The urban diversity created by the interdependencies and interactions between investors, companies and inhabitants is the basis for continuous economic growth. Last but not least, the urban identity created by the identification process between all social groups and the urban environment is the basis for social equity. The model in *Figure 1* illustrates the triadic principles of all the components that produce the urban environment, its qualities and sustainability factors. All producing elements are interconnected. This means that identity, for instance, is the key to establishing social equity, but it also contributes to economic growth as well as ecological balance. Below, this model is applied to the investigation of the challenges regarding sustainable urbanism in the emerging city of Qatar's capital Doha. All three dimensions of space production are thus separately analysed in the context of the urban qualities needed for sustainable urban development.

Fig. 1: The interdependent production of sustainable urbanism and the key sources of the three main urban qualities. Source: Authors.

Methodology

This paper is based on a series of interviews with ten urban planners at the Qatar National Master Plan division of the Ministry of Municipalities and Urban Planning in Doha in order to investigate past and present developments within urban governance. After face-to-face interviews were carried out, interviewees were requested to evaluate the most important factors within public visions, strategies and planning. They rated the importance in their view of the various factors on a scale from 1 (least important) to 5 (most important).

The investment patterns in real estate have been analysed by comparing GIS data from 2003, 2006 and 2009 to the state of development in 2012 by focusing on an assessment of urban developments according to land uses. The initial GIS data from 2011 was provided by the Ministry of Municipalities and Urban Planning. The authors updated the data by various survey techniques including field surveys and the evaluation of high-resolution satellite images. The GIS data was also used as the basis for investigating 150 company locations and their spatial integration. All selected companies are engaged in advanced producer services (APS) and have international profiles. Bill Hillier's Space Syntax methodology was applied to examine the accessibility of common business centres in Doha on a macro scale. In the case of inhabitant movements, 130 employees of the companies selected responded to a survey questionnaire that examines their weekly activities. The resulting distances between locations were calculated on the basis of the existing GIS maps.

Finally, the complex relationship between inhabitants and the urban environment was explored by using questionnaires. All in all, 350 employees from 21 companies within the advanced producer service sector participated in a survey in 2012. All questionnaire participants have medium incomes and are from various cultural backgrounds and age groups. Due to the fact that around 85% of Doha's current population is foreign, all participants are guest workers. Questionnaire responses were specifically analysed regarding liveability factors as well as individual professional perspectives. The questionnaires included multiple choice questions in addition to the opportunity for participants to fill in individual answers. The questions were categorised in six sections including general information such as age and country of origin as well as detailed information regarding their experiences concerning mobility, housing, places of work and the amenities and services available (Fig. 2). In the last section the questionnaire attempts to explore the various motivations of foreign employees for moving to Doha as well as their individual perceptions regarding five characteristic urban spaces in Doha.

Fig. 2: Main issues of a questionnaire exploring individual perceptions of the quality of urban life in the case of Doha. Source: authors.

Regional and Historical Background

As in the case of most Gulf cities Qatar's capital Doha underwent a distinct evolution from a small oasis settlement to an emerging regional service centre. Due to the harsh climatic circumstances and low water supply settlements along the Gulf coast were mainly based on limited oasis agriculture and the trading routes of Bedouin tribes (Jabbur, 1995). The symbiotic relationship between settled populations along seaside *wadis* as well as inland oases and nomadic tribes with their flocks formed the main economic basis for centuries. Due to increasing trade between the British Empire and its colonies in Asia, particularly India, during the 18th and 19th centuries, the settlements along the Gulf coast entered a new phase in their evolution, becoming small trading ports (Al Naqeeb, 1990, p. 25). One major factor was the emerging pearl trade, which attracted large inland tribes to resettle on the Gulf coast. As in the case of oil during the 20th century, the pearl trade led to new social structures. While Persian and Indian immigrants

settled along ports in order to develop import and export businesses or work as craftsmen, East-African slaves were brought as pearl divers (Zdanowski, 2013).

Until the pearl trade collapsed during the 1920s due to the invention of pearl harvesting techniques in Japan, certain settlements such as Dubai or Manama, grew to more than 20,000 inhabitants (Wirth, 1988). In the case of Doha the population reached a peak of 27,000 residents and a settlement area of one square kilometre (Al Buainain, 1999, p. 149). As in other Gulf cities the settlement structure followed the basic principles of traditional Islamic desert settlements, as described by Besim Hakim in his book *Arab-Islamic Cities: Building and Planning Principles* (1986), and was defined by vernacular road networks of cul-de-sacs, which enhanced the privacy of neighbourhoods, known as *ferej*, and the market, located close to the port and constituting the central public realm.

Despite the fact that oil was found along the Gulf coast during the 1930s, oil production did not commence before the end of World War II. Subsequently, many settlements witnessed harsh economic problems and the number of inhabitants dropped significantly. In Doha less than 16,000 inhabitants remained after the end of the pearl trade (Al Buainain, 1999, p. 149). Before Gulf states gained national independence at the end of the 1960s and the beginning of 1970s, the Gulf coast was a protectorate of Great Britain. American oil companies however gained concession rights and a new chapter of urbanism along the Gulf coast began. The first settlements of these oil companies were the first to introduce modern infrastructure as well as new building technologies and typologies (Reichert, 1978). Between the 1940s and 1960s infrastructure projects such as airports and the first road networks defined settlement structures, which were not yet guided by any holistic plans from a central public administration (Wiedmann, 2012, p. 25). In the case of Doha this transition period was marked by scattered housing projects for local populations as well as immigrants, which led to a rapid population increase to 83,000 inhabitants in 1971 (Al Buainain, 1999, p. 217).

After national independence the oil boom during the 1970s and 1980s led to an enormous settlement growth in most cities, which followed the first implementation of master plans introduced by foreign consultants. The proposed functional division of land uses and the car-based infrastructure led to cities with the lowest urban densities worldwide. While the old city centres were replaced by commercial buildings and apartment blocks for foreign labour, low-rise housing areas rapidly extended the urban periphery (Al Hathloul, 1996).

At the end of the 20th century the Emirate of Dubai introduced a new model of urbanism by implementing growth-oriented development strategies in order to diversify the economy. The subsequent liberalisation of local real-estate markets led to a vast construction boom and a new chapter of urban development in the Gulf (Schmid, 2009). Most cities became hosts to various mega-projects, which were usually launched by newly founded holdings whose main shareholders are usually public institutions due to the fact that most unbuilt land is considered to be the property of the state and thus under the authority of rulers. Consequently, new typologies such as reclaimed islands and high-rise agglomerations emerged and transformed the previous urban morphologies. The new focus on expanding real estate markets as diversification strategy led to the

decentralisation of urban governance and the common practice of case-by-case decision-making. Today, local urban planners face an environment that is difficult for the implementation of holistic legal frameworks that would guide urban developments toward more sustainable structures. In the following, all the main factors producing the urban environment are explored in the case of Doha in order to provide a unique inside view on the range of challenges to more sustainable Gulf cities.

1. The Role of Governance in Establishing Urban Efficiency

1.1 The Introduction of a Holistic Development Vision

After the oil boom in the 1970s and 1980s a new economic vision was introduced at the end of the 20th century. The change in Qatar's rulership in 1995 when Sheikh Hamad Bin Khalifa Al Thani came to the throne opened the door to a new path of economic development for what was a restrictive and conservative country (Scholz, 1999, p. 185). The newly introduced vision of developing an emerging hub within international networks has, however, involved the development of new socio-economic realities and has taken little account of existing conditions (GSDP, 2011, p. 163). Thus, the still existing wealth of fossil fuels and the resulting public investments can be considered as the main drivers of any hub strategy in Qatar, in a similar fashion to cases in other Gulf cities (Davidson, 2009, p. 182). Thus, the idea of developing Doha into a service hub as well as cultural hub in the region replaced the previous understanding of urban environments by decision makers in Qatar as the simple necessity of supplying inhabitants with acceptable living conditions. This change was accompanied by a reinterpretation of governance in a more entrepreneurial sense instead of the former conception of being a rentier state based on fossil fuels (Wiedmann, Salama and Thierstein, 2012b). Today, five main hub visions can be distinguished based on recently initiated public development strategies:

- *The investment hub:*

Due to Qatar's wealth, its location and its relatively small size it provides attractive conditions for investors worldwide. Due to the various development potentials resulting from public investments and liberalisation incentives there has been a construction boom since 2003 as a direct consequence of the vision to establish Doha as a rising investment opportunity (Colliers International, 2008).

- *The transit hub:*

Based on a fortunate geopolitical location within the Gulf region and globally between three major continents, Qatar's government recognised a potential for developing its capital Doha into a hub within regional as well as global transit networks (Ministry of Business and Trade, 2013, p. 9).

- *The cultural hub:*

Because of the potentials of becoming an attractive travel destination, particularly for transit passengers, Qatar's rulers understood the importance of cultural projects. One

aspect has been therefore the early focus on international sports events (GSDP, 2011, p. 53).

- *The knowledge hub:*

In order to build a long-term service centre based on knowledge economies Qatar's government recognised that it was important to emphasize education and science as one of the foundations for future prosperity. The general lack of universities and research centres with an international profile in the Gulf region fuelled the ambition of decision makers to establish Doha as an emerging centre of higher education in the Middle East (Miles, 2005, p. 20).

- *The political hub:*

In addition, Doha was conceived by decision makers as a potential political centre in the Middle East mediating the various interests in the region and beyond. Due to various factors of political instability in the Gulf region Qatar's rulers envisioned their country as a mediator and initiator of new collaborations and cooperation between GCC countries and the international community (Barakat, 2012, p. 3).

Thus, despite its parallels with other emerging cities worldwide, Doha should be considered a very particular case, not only because of its economic basis on fossil fuels but also because of its political realities wherein ruling families are engaged in both the public and private sectors. This transformation of governance was highly influenced by the rulers of Dubai, whose pioneering efforts to establish an international hub in the region can be traced back to the 1980s (Schmid, 2009, p. 140). Subsequently, Qatar's ruling families became a visionary force with their introduction of a new form of urbanism based on their five hub strategies to integrate Doha in international networks. Due to the focus on developing distinct hubs Doha is characterised by a specialisation in certain areas. In this respect, exclusivity defines the overall hub vision rather than undefined expansion in order to permit consolidated urban growth (Adham, 2008, p.248). The Qatar National Vision (QNV), which was introduced in 2008, has therefore emphasised a growth limit of 2.8 million inhabitants by 2030, which is in clear contrast to other Gulf cities such as Dubai where an urban growth toward 10 million inhabitants has been envisioned for the same time frame (GSDP, 2011, p. 55). All five hub visions are currently being pursued through distinct public investment strategies that follow the recently introduced Qatar National Development Strategy, which is based on the QNV (GSDP, 2008).

The interviews with planning experts reveal that the comprehensive vision of transforming Doha into an international hub was not implemented in the form of any official plan before 2008. According to the perception of most interviewees the focus on establishing Doha as an emerging investment hub was the main driver in recent urbanism until the Qatar National Vision was introduced (Fig. 3). Thus, it can be stated that the initial absence of any holistic development vision led to a speculative environment, which was initiated by large-scale public investments and which has resulted in exponential growth.

Fig. 3: The hub visions in Doha as perceived by planning experts. Source: Authors.

1.2 The Development Strategies

Based on these new hub visions public investments were launched in various areas in order to create a suitable environment for an expanding private sector. In this regard, public holdings were often introduced to develop profit-oriented subsidies in all economic sectors, which accelerated growth by stimulating markets. Thus, it can be argued that public investments were in most cases catalysts of recent economic diversification processes, which were usually accompanied by the deregulation of markets (Fox, Mourtada-Sabah, Al-Moutawa, 2006, p. 8). The recent investments in urban developments sparked the immigration of hundreds of thousands of guest workers, particularly from South Asia (Naqy, 2006). Since the mid-1990s the population has more than tripled, making Qatar one of the fastest growing nations in the world. Almost 90% of Qatar's current population of around 1.8 million lives in Doha and its metropolitan area (Qatar Statistics Authority, 2011, p. 13). This rapid urban growth was mainly caused by the direct investment of oil and gas revenues, which can be categorized into five main areas:

- *Investments in real estate:*

Major public real-estate investments are made by the Qatar Investment Authority and its subsidiary Qatari Diar Real Estate Investment Company, which was founded in 2004 (QIA, 2012). In addition to Qatari Diar's function of founding master developers such as Lusail Real Estate Development Company to carry out projects, it holds 45% of the shares in Barwa, the largest listed real-estate company in Qatar (Barwa, 2011). Further public real-estate investments are made by the Qatar Foundation and its subsidiaries.

- *Investments in infrastructure and services:*

In order to become a global hub large investments were made to expand the existing airport and harbour as well as to develop new facilities. A new airport development was launched in 2004, with estimated funds of over USD 11 billion, on a reclaimed area of 890 hectares to the east of the existing runways (NDIA, 2012). Parallel to this, Qatar Airways, one of the fastest growing airlines in the world, is directly funded by the state with the aim of turning it into one of the world's leading aviation providers (CAPA, 2011). These investments make Qatar a serious future competitor as a transit hub for passengers and cargo beyond the Gulf region itself.

- *Investments in tourism:*

Several efforts were made to attract international sport events to Qatar such as the Qatar Tennis Open and the 2006 Asian Games. While large investments in sport events led to the recent successful bid for the 2022 FIFA World Cup, the development of cultural landmark projects has also been important in attracting tourists. The first project in this

regard was the redevelopment of the traditional market area, known as Souq Waqif, followed by the Museum of Islamic Art.

- *Investments in education and science:*

Qatar's rulers initiated the development of educational and research facilities in order to build a foundation for a more diversified economy. Thus, in 1995 the Qatar Foundation was introduced as a non-profit organisation to develop a basis for new economies by focusing on three pillars, namely, education, science and community development (OBG, 2009, p. 23). Its first project was Education City, the development of which was launched in the north-west of the city in the late 1990s (Adham, 2008, p. 243). In order to attract high-profile universities various investments were made such as the USD 759 million that was invested in Cornell University in order to open a faculty in Doha (Miles, 2005, p. 21). Science and research are promoted by the subsidiaries of the Qatar Foundation, namely, the Qatar National Research Fund and the Qatar Science and Technology Park.

- *Investments in media:*

The founding of Al Jazeera in 1996 changed the world's perception of Qatar due to its role as a news provider from the Middle East. Despite the fact that the initial funds of USD 137 million were provided by the Emir, Al Jazeera has always claimed that it maintains an independent editorial policy (Sakr, 2001, p. 58). This liberalised news network has influenced an understanding of Qatar as a progressive and politically engaged country in the Gulf. Despite the still open question of the extent to which Al Jazeera can be considered independent, it has had a major impact on the development of the media in the Middle East as the voice of the people instead of simply a reflection of political agendas (Rinnawi, 2006, p. 23).

Recent investment strategies have mainly focused on stimulating urban growth by launching large-scale projects and by creating a new city image. According to the interviewees the most decisive public investments that will transform Doha into a hub city are large-scale infrastructure projects (Fig. 4). Recent infrastructure developments such as the new airport are, however, mainly focused on linking Doha to international transit networks, while local infrastructure such as public transportation is still missing. Thus, most public development strategies have aimed to enter global networks and stimulate growth rather than enforce local urban consolidation needed for efficient structures.

Fig. 4: Current development and investment strategies as viewed by planning experts. Source: Authors

1.3 The Impact of Urban Planning and Administration

While economic visions are being put into place by investment in various strategies and liberalisation policies, urban planning has faced the challenge of guiding the recent

construction boom toward the creation of a functioning metropolis. The idea of developing Doha into an international service hub resulted in large-scale developments and a new form of decision-making in physical planning. The last comprehensive master plan, known as the Physical Development Plan (PDP), was prepared during the 1990s (Louis Berger International, Helmuth, Obata and Kassabaum, 1997). Although it is still used as the basis for general land-use policies its implementation in 1997 has had a rather limited impact on Doha's urban development because of the increasing influence of new public authorities and public-private partnerships (Adham, 2008, p. 237). This merge of the public and private sectors was a direct consequence of expanding investments and the liberalisation of markets. In order to develop Doha into a well-connected international hub many projects were initiated without being part of comprehensive planning (Wiedmann, Salama and Thierstein, 2012b, p. 51). Based on an interview series with ten urban planners at the Ministry of Municipalities and Urban Planning four main causes were identified as to why urban planning was decentralised and why case-by-case decision-making replaced central planning:

- *Staff capacity:*

The new urban development strategies at the end of the 1990s and the subsequent investment pressure challenged a public administration that was not able to manage urban growth on this scale and of this nature. The limited staff capacity did not permit the urban planning department to coordinate urban developments with the implementation of new plans or the adjustment of existing plans within a very short period of time.

- *Organisational structure:*

A further cause for the decentralisation of urban planning has been the lack of any coordinating and communicating organisation between the various departments and stakeholders. While during the oil urbanisation developments followed a general pattern and thus planning and its implementation was based on fixed procedures, the various investments in projects have made urban development more dynamic and complex. Consequently, many parallel developments were carried out without being centrally coordinated or surveyed.

- *Reliability of existing plans and policies:*

Due to the new situation of unprecedented amounts of investment being made in Doha's urban development, existing zoning plans that were developed on the basis of the PDP have quickly become outdated. Furthermore, zoning plans have lost the status of legally binding documents and have been treated in many cases as technical recommendations rather than development regulations. The most prominent example of this is the development of high-rise buildings in West Bay, where the original zoning plan restricted the maximum building height to eight floors. After a first adjustment to a maximum height of fifteen floors, the restriction was completely cancelled at the end of the 1990s, permitting unlimited heights.

- *Legal rights of master developers:*

In addition to the fact that initial zoning plans have been bypassed in many cases, another phenomenon that decentralised governance was the rise of what is known as 'mega-

projects' (Fig. 5). These projects are usually connected with investment strategies and are thus in most cases joint ventures between the private and public sectors. For all mega-projects one master developer is founded to coordinate the development and given extensive legal rights to develop and implement master plans for their projects without approval from the ministry and its urban planning departments. Thus, these mega-projects are governed as cities within the city with a relatively limited relationship to their surroundings involving mainly infrastructural concerns.

Fig. 5: Map of current mega-projects in Doha. Source: Authors.

Most interviewees at the MMUP were of the opinion that an inefficient organisational structure in combination with a *laissez-faire* attitude regarding existing policies were the main factors for the decentralisation of urban planning in Qatar (Fig. 6). Moreover, staff capacity deficits exacerbated and accelerated this process, particularly at the beginning of the construction boom. The allocation of legal rights to master developers regarding the design and implementation of zoning plans was another factor decentralising urban planning. The previous centralised process of holistically defining land use has thus been partially replaced by case-by-case decision making. The resulting urban structure can be best described as a patchwork of various developments connected by macro-infrastructural projects. The dynamics between large-scale public investments and the liberalisation of markets have changed the role of urban planning from a centralised administration coordinating urban growth into a multi-layered cooperation between various stakeholders (Fig. 7). Today, the mediation between the interests of various landowners and newly designed legal frameworks can be seen as a major challenge for urban governance.

Fig. 6: Decentralised governance as viewed by planning experts. Source: Authors.

Fig. 7: Current organisational structure of urban planning in Qatar. Source: Authors.

2. The Factors Producing Urban Diversity

2.1 Developers and their Impact on Urban Morphologies

Based on the five major public development strategies rapid urban growth was initiated particularly after 2003, when the population increased from around 744,000 inhabitants to about 1.8 million in 2013. Thus, almost one million people moved to Doha within only

nine years. Although other developments such as the extension of the industrial hub in Ras Laffan have also contributed to increased immigration, the main factor should be seen in the construction boom in Doha and its metro region. In a survey of 2010 by the Qatar Statistics Authority almost 40% of labour was directly engaged in the construction business itself. Another 30% to 40% was engaged in general services wherein growth is indirectly linked to the immigration fuelled by the expanding real-estate market (Qatar Statistics Authority, 2012). Thus, it can be stated that the construction boom has been a major cause of new socio-economic realities and social structures. In addition, urban morphologies have witnessed an extensive transformation process during this short period of less than ten years.

Based on the authors' GIS survey the recent construction boom caused the total settlement area of metropolitan Doha to grow from around 162 square km in 2003 to around 292 square km in 2012, which is more than 80% of its previous size (Fig. 8). During the first period between 2003 and 2006 developers focused on commercial projects, which had a share of around 50% of the total built-up area (Fig. 9). These commercial developments were mainly office buildings located in West Bay and along C-Ring Road in addition to several shopping malls. After the first period of rapid growth, which was fuelled by initial investments and the Asian Games in 2006, a total area of almost 50 square km was added. Due to the international financial crisis in 2008 and an oversupply of commercial projects less than 17 square km of settlement area was built during 2006 and 2009, which meant a decrease of 66% in the growth rate. However, the growth rate picked up again during 2009 and 2012 when a total area of 62 square km was developed in addition to the new airport development of approximately 22 square km. In contrast to the first extensive development period between 2003 and 2006 over 95% of the total development area between 2009 and 2012 is occupied by low-rise residential projects in the periphery of Doha. According to the GIS data and field surveys developers and their investors focused on four distinct development types:

Fig. 8: The settlement growth between 2003 (grey areas) and 2012 (black areas). Source: Authors.

Fig. 9: Evaluated land use statistics based on GIS survey. Source: Authors.

- *Up-market real estate in mega-projects:*

One main focus of developers has been freehold property projects in master-planned surroundings. The most prominent example is the Pearl development of the United Development Company, a reclaimed island along the northern coast of Doha (Fig. 10). This kind of project integrates a mixture of residential high-rises, apartment buildings and villas, served by leisure and retail facilities.

Fig. 10: The Pearl development. Source: Authors.

- *The high-rise agglomeration in West Bay:*

The prominently located West Bay area has been developed mainly for public or semi-public tenants such as ministries or QATARGAS. In addition, residential projects and hotel developments have been launched. Today, more than 88 high-rise buildings have been completed in the West Bay, which has become the main icon of modern urbanism in Qatar.

- *The commercial and residential projects in downtown areas:*

Due to the rapid need for more affordable and accessible office space and housing units a large quantity of commercial and residential developments have been launched along the C-Ring road towards Doha International Airport. Two main agglomeration of these developments can be found in Al Sadd and Al Salata, where a lot of commercial and residential developments were built in the form of multi-storey blocks.

- *Suburban villas and compounds:*

Another focus of particularly smaller developers has been villas, detached or semi-detached, in Doha's suburban areas. Many of these projects take the form of compounds and are financed by individual Qatari landowners, who rent their developments to companies and their staff. According to the GIS survey, more than 50% of Doha's entire urban area is currently occupied by low-rise residential developments, causing a low average density of less than 6,000 people per square kilometre.

- *Shopping-mall complexes:*

Three major shopping malls have been developed in West Bay, Al Duhail and Al Aziziyah. While the City Centre Mall in West Bay is the most central shopping mall, Landmark Mall and Villagio Mall have been built in Doha's periphery. Today, several large-scale mall complexes are under construction. The most prominent example is the Doha Festival City in the north of Doha providing 260,000 square metres of retail space by 2014 (Doha Festival City, 2013).

Real estate investors have been reshaping Doha through mega-projects, high-rise agglomerations and extensive suburban developments. While developers certainly diversified Doha's built environment with regard to the introduction of new typologies, their focus on short-term profits has led to a lack of flexibility within urban structures due to patchwork developments and monotonous repetitiveness of buildings. Due to lower land prices in the outskirts Doha has witnessed a rapid urban sprawl of low-rise residential developments causing an urban periphery with hardly any variety in urban densities. Another characteristic result of the recent construction boom in Doha is masses of poorly constructed projects with low security standards and high dependency on air conditioning (GSDP, 2011, p. 193). A further problem is the common practice of choosing one major contractor and architectural consultant for large-scale developments, which can lead to monotonous and repetitive designs. The main reason for the lack of

diversity is however the absence of a major demand-driven momentum due to the continuous exchange of companies and their staff. Most developments are rented short-term and due to rapid growth and the increasing demand for real estate, competition between landlords to deliver high building standards has remained low.

2.2 The Role of Companies and their Networks

One major basis of Qatar's service sector are large-scale local holdings such as Al Fardan and Al Mannai, whose background is the oil and gas business (Al Mannai, 2012). These large-scale holdings founded subsidies that deal in various sectors from construction, trade and telecommunications to logistics. In addition to these local company networks organised in the form of holdings, many international companies have relocated to Doha, particularly those working in the construction related advanced producer services. In most cases offices are rented according to the criteria of affordability and accessibility, which has caused a concentration in central areas, like Al Salata, in proximity to the international airport.

In recent years, the rapidly increasing number of companies has caused new commercial developments at the periphery of the downtown area, particularly along the C-Ring road. A GIS survey of 150 company locations in combination with a Space Syntax analysis illustrates the preference of major APS companies to locate in accessible locations due to the required interaction with other companies and clients as well as the need for spatial proximity to the residences of employees (Fig. 11). The previous zoning plans have permitted commercial developments mainly along the central road grid. In recent years many office buildings have been built in West Bay, where the prospect of gaining public or semi-public tenants has attracted investor interests. These office towers however do not suit most international companies due to high rents, reduced accessibility, missing services and large office sizes. Consequently, the envisioned Central Business District in West Bay faces current office vacancy rates of more than 17% (DTZ, 2012). Most companies of the private sector locate in areas like Al Sadd along C-Ring, which is leading to newly emerging urban centres and densification processes due to the subsequent construction of residential projects and services (Mirincheva, 2012).

Fig. 11: A Space Syntax study based on GIS survey illustrating the location of international companies. Most company locations are found along the highly integrated C-Ring Road. Source: Authors.

2.3 The Inhabitants' Spatial Practice

Notably, rental prices in the city are highest to the north and along the waterfront, particularly in West Bay. Subsequently, most medium-income inhabitants live in proximity to the old city centre along B- and C-Ring or in compound developments in Doha's inland periphery. In order to explore the various ways inhabitants use the urban

environment of the city, 350 questionnaire responses received from inhabitants of medium income and differing cultural backgrounds were analysed. Each questionnaire participant was requested to provide the addresses of their residences, favourite leisure spaces, preferred grocery stores and working places. Around 130 participants provided accurate addresses, which could be located in the GIS map. The analysis conveys that 70% of these participants are accommodated in apartment blocks along A-, B- and C-Ring, while around 20% reside in compounds in the periphery and the remaining 10% are housed in waterfront developments along the northern shore. According to GIS calculations most participants live on average at distances of around 7 kilometres to their working places, 6 kilometres to their favoured grocery stores and 8 kilometres to their favourite leisure spaces. The main leisure spaces include hotel developments in West Bay, the Corniche as well as Souq Waqif in the old city centre and shopping-mall complexes in the periphery. Based on the GIS survey of current data only around two square metres of public green area per inhabitant is currently supplied in the city. The map of inhabitant movements (Fig. 12) illustrates the long distances between various locations and the lack of integration of services on district scales. Today, the most integrated urban area is the Al Sadd district due to its high spatial accessibility along C-Ring on a global and local level. Therefore, it can be argued that in the future the tendency of inhabitants to prefer services at short distances will lead to more integrated and diverse urban districts. The continuous exchange of immigrants however currently still hinders the demands of communities from having a more efficient impact on development patterns.

Fig. 12: The movement map of 130 inhabitants and their weekly activities. The map clearly indicates a higher level of land use integration in Al Sadd due to shorter travel distances. Source: Authors.

3. The Emerging Urban Identity of Doha

3.1 The Role of Liveability

Liveability is perceived by inhabitants subjectively and is thus highly dependent on cultural background, life experiences and general expectations. Due to the relatively high salaries and additional benefits around 20% of Doha's population can experience life as rather enjoyable in terms of leisure time (Qatar Statistics Authority, 2012). In order to investigate liveability in Doha the 350 questionnaire participants were asked how current urban life is experienced. The main factors that reduce their perception of liveability in Doha are mobility concerns related to traffic congestions, driving distances and a lack of parking spaces and insufficient services (Fig. 13). Another factor is the low standard of construction quality in the case of their residences and offices. In the case of the majority of inhabitants working in low service sectors the perception of liveability varies between two main perspectives, namely that of the Arab immigrants, who are often second-

generation immigrants in Doha, and the South-Asian guest labour. While Arab immigrants, who usually reside in their own families and communities close to the historic city centre, often have long-term plans to settle, Asian labour, which is usually not permitted to move with families, immigrate on a short-term basis. In spite of their low salaries and the low quality of their surrounding environment, life in Doha is often accepted as bearable due to their state of emergency and previous experiences in underdeveloped countries (Nagy, 2006).

Fig. 13: Frequency of inhabitants' responses to issues related to liveability factors in Doha (based on 344 responses). Source: Authors.

3.2 Individual Career Perspectives

While the perceived liveability of a city is the immediate result of how people feel about Doha regarding their current needs, the individual perspectives to settle long-term in Doha are dependent on future economic aspects as well as legal rights for immigrants. A city with global ambitions such as Doha can stimulate expectations due to continuous growth and newly emerging business opportunities. From Al Jazeera and Education City to the new skyline in West Bay and the successful bid of the FIFA world cup, Doha offers a variety of these perspectives. However, any start-up business of foreign companies in Doha needs a local sponsor and due to high rental costs and the predominance of local holdings in service sectors entrepreneurial initiatives have remained restricted (GSDP, 2011, p, 89). In the case of the local population the Qatar Foundation has played a very important role in expanding the professional perspectives of young people (Miles, 2005, p. 21). Today, Qatar's service economy is to a large extent dependent on foreign guest workers, who make up 93% of the private sector (Qatar Statistics Authority, 2012). While public incentives to integrate the local population in developments is necessary for implementing the end of welfare mechanisms, these strategies also imply reduced long-term perspectives for guest workers in certain areas. Today however 66% of the questionnaire participants perceive Doha as a potential place to settle due to career opportunities and high salaries, among other factors (Fig. 14).

Fig. 14: Frequency of inhabitants' responses related to their long-term individual perspectives (based on 350 responses). Source: Authors.

3.3 The Impact of Cultural Values

The third factor in producing an identification process is based on the image of a city and its aesthetics from an inner cultural perspective. In this regard, the architectural language plays an important role in creating an environment of either familiarity or alienation.

Most questionnaire participants see the Corniche and the West Bay towers as the most representative image of Doha (Fig. 15), which can be interpreted as a success on the part of recent landmark strategies in the establishment of an international appearance. Only 13% of participants identify the Souq Waqif as the most prominent landmark in Doha. However, a majority of 65% of participants perceive the Souq Waqif as a highly attractive leisure space (Fig. 15). In addition to landmark projects, general urban design, particularly in the case of public spaces, can have a large impact on how space is aesthetically experienced. Due to its low built density Doha is dominated by low-rise housing and because privacy is usually protected by walls, large urban areas are experienced as rather rejecting by most participants. The generic architectural design of housing is, in addition, rather detached from its climatic and cultural surroundings in spite of a large variety of oriental decoration. Today, Doha's architectural language reflects the struggle of finding an identity between Arab architecture and post-modern pluralism on the basis of generic designs interrupted by showcase projects from star architects.

Fig. 15: Inhabitants' perception of urban spaces in Doha (based on 275 responses). Source: Authors.

Conclusion

Based on the framework introduced the paper explored the three dimensions of urban qualities needed for sustainable development in Doha. The applied methodologies include an interview series with planning authorities in combination with GIS evaluations and questionnaires. Based on these empirical studies the various factors needed to produce urban efficiency, diversity and identity have been explored. As a result, three major challenges facing sustainable urbanism can be identified:

- *The Challenge of Supplying an Efficient Urban Structure:*

The urban quality of efficiency, which is the basis for any ecological urban growth, relies to a large extent on urban governance, which is responsible for supplying holistic visions, development strategies and the implementation of legal frameworks. In the case of Doha the first vision to create an international hub was not restricted by any growth limitation until the Qatar National Vision was introduced. The subsequent rapid urban growth was hardly regulated due to outdated planning, capacity deficits within the public administration and the decentralisation of decision-making. The result has been a fragmented urban structure with three main characteristics – extensive mega projects, high-rise agglomerations and continuous urban sprawl. The lack of cohesion between urban areas was exacerbated by the isolated process of decision-making regarding large-scale developments. Furthermore, the lack of urban efficiency increased by insufficient infrastructural consolidation, which includes the missing integration of efficient public transportation. Today, the two main challenges of urban governance are the implementation of holistic and central planning based on comprehensive legal

frameworks as well as the introduction of public transportation to enforce urban consolidation and thus ecological balance.

- *The Challenge of Developing Diversity:*

The urban quality of diversity is mainly dependent on the spatial practice of investors, companies and inhabitants. In the case of Doha developers and their investors play the most decisive role in diversifying the urban environment since their speculative interests have been the driving force of the recent urbanisation process. A major problem of this kind of urbanisation basis is a lack of direct interaction between developers and end-users of properties. Most real estate is developed for short-term investment interests rather than with an expectation of long-term returns. Thus, neither companies nor individual inhabitants can choose between a variety of locations, construction qualities, rental prices and typologies regarding offices and residences. This lack of physical diversity in combination with legal rigidity regarding business initiatives is, however, problematic for flexible and dynamic economic growth in service sectors. Thus, the major challenge is to restrict the growth dependency on real-estate markets in order to stimulate demand-driven incentives within other emerging economic sectors. Consequently, urban diversity in Doha can only be established by a shift on the part of the private sector from short-term interests to long-term commitments.

- *The Challenge of Creating an Identity:*

The urban quality of identity is based on the perception of a majority of the population regarding liveability, individual perspectives and the cultural values of a city. Often underestimated in the case of emerging cities such as Doha, identity is essential for the inner consolidation of a society. Only a society with a shared level of identification to its environment can be considered sustainable. Today, the immense social segregation between income groups in Doha is not experienced as a very grave potential threat to stability. The images created by contemporary Doha are, however, fragile due to their superficial nature. Thus, creating identity is not only the challenge of city-branding strategies. Identity is to a large extent created when inhabitants can become active participants in spatial developments rather than excluded observers. Therefore, the major challenge is to integrate migrant communities long-term in the development of future Doha while sustaining the distinct cultural identity of a Gulf city.

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